

AMENDMENTS TO THE CLAIMS:

This listing of claims replaces all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A fuel cell assembly comprising:

a fuel cell stack having at least one inlet port for receiving cooling water and at least one outlet port for discharging water and/or water vapor ~~vapour~~, the inlet port and the outlet port each communicating with at least one membrane electrode assembly of the fuel stack; and

a thermal storage tank having a heat exchanger conduit therethrough, the heat exchanger conduit having an inlet and an outlet coupled respectively to the at least one outlet port and the at least one inlet port of the fuel cell stack to form a cooling circuit for the fuel cell stack.

2. (Currently Amended) The fuel cell assembly of claim 1, further comprising ~~including~~ a condensate collection unit in the cooling circuit between the heat exchanger outlet and the inlet port of the fuel cell stack.

3. (Currently Amended) The fuel cell assembly of claim 1, further comprising ~~including~~ a water pump in the cooling circuit between the heat exchanger outlet and the inlet port of the fuel cell stack.

4. (Currently Amended) The fuel cell assembly of claim 1, wherein ~~in which~~ the thermal storage tank ~~includes~~ comprises a water jacket surrounding the heat exchanger conduit.

5. (Currently Amended) The fuel cell assembly of claim 4, wherein ~~in which~~ the water jacket further ~~includes~~ comprises a cold water feed and a hot water draw off point.

6. (Currently Amended) The fuel cell assembly of claim 4, ~~or claim 5~~ further comprising ~~including~~ an electrical heating element for heating the water jacket, the electrical heating element being coupled to an electrical output of the fuel cell stack.

7. (Currently Amended) The fuel cell assembly of claim 1, further comprising ~~including~~ a pressure regulation means for controllably exhausting waste gases from the cooling circuit.

8. (Currently Amended) The fuel cell assembly of claim 1, wherein ~~in which~~ the thermal storage tank ~~includes~~ comprises a secondary water circuit passing therethrough for supplying a space heating radiator system.

9. (Currently Amended) The fuel cell assembly of claim 1, wherein ~~in which~~ the inlet port of the fuel cell stack receiving water from the cooling circuit is coupled to a direct water injection system of the anodes and/or cathodes in the fuel cell stack.

10. (Currently Amended) The fuel cell assembly of claim 1, wherein ~~in which~~ the inlet port of the fuel cell stack receiving water from the cooling circuit is coupled to provide preheat of fuel and/or oxidant supply to the respective anodes/cathodes.

11. (Currently Amended) The fuel cell assembly of claim 5, further comprising ~~including~~ a valve coupled between the hot water draw off point and a waste water outlet, and a temperature sensor in the cooling circuit for actuating the valve when the water in the cooling circuit exceeds a predetermined temperature.

12. (Currently Amended) The fuel cell assembly of claim 1, wherein ~~in which~~ the at least one outlet port comprises a cathode exhaust port.

13. (Currently Amended) A method of operating a fuel cell assembly, comprising ~~the steps of:~~

feeding fuel and oxidant into a fuel cell stack to generate electrical current and water/water vapor ~~vapour~~ by-product;

feeding the water/water vapor ~~vapour~~ into a heat exchanger conduit of a thermal storage tank and extracting heat energy therefrom;

retrieving water and vapor ~~vapour~~ condensate from the heat exchanger conduit and supplying it back to a membrane-electrode assembly in the fuel stack; and storing the thermal energy in the thermal storage tank,

the fuel cell stack and heat exchanger conduit forming a water cooling circuit.

14. (Currently Amended) The method of claim 13, further comprising ~~including~~ collecting the retrieved water and vapor ~~vapour~~ condensate in a condensate collection unit in the cooling circuit between the heat exchanger and an inlet port of the fuel cell stack.

15. (Currently Amended) The method of claim 13, further comprising ~~including the step~~ of storing the retrieved energy in a water jacket of a thermal storage tank.

16. (Currently Amended) The method of claim 15, further comprising ~~including the step~~ of drawing off heated water from the water jacket and replenishing with cold water.

17. (Currently Amended) The method of claim 13, further comprising ~~including the step~~ of heating water in a second water circuit from the thermal storage tank.

18. (Currently Amended) The method of claim 13, further comprising ~~including the step~~ of providing the retrieved water and vapor ~~vapour~~ condensate as input to a direct water injection system of anodes and/or cathodes in the fuel cell stack.

Applicants : Peter David Hood, et al.
Serial No. : Not Yet Assigned
Filed : Herewith
Page : 7 of 8

Attorney's Docket No.: 17638-006US1
Client Ref.: INTEU/P29548US

19. (Currently Amended) The method of claim 13 further comprising ~~including the step~~
~~of~~ providing the retrieved water and water vapor ~~vapour~~ condensate to the fuel cell stack for
preheat of fuel and/or oxidant supply to the respective anodes/cathodes.

20 and 21. (Canceled)